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January 28, 1997

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

BY HAND DELIVERY

William F. Caton
Acting Secretary
Federal Communications Commission
1919 M Street, N.W., Room 222
Washington, DC 20057

Re: GN Docket No. 96-228 - Notice of Ex Parte Meetings

Dear Mr. Caton:

On January 23, 1997, a series of ex parte meetings was held between representatives of DigiVox Corporation ("DigiVox") and the Commission staff as listed below:

1. David R. Siddall, Office of Commissioner Ness
   John Prawat, President and Chief Executive Officer of DigiVox
   Eliot J. Greenwald, Fisher Wayland Cooper Leader & Zaragoza L.L.P. ("Fisher Wayland"), representing DigiVox
   Ronald M. Harstad, Ph.D., Economist representing DigiVox

2. Suzanne Toller, Office of Commissioner Chong
   John Prawat, President and Chief Executive Officer of DigiVox
   Eliot J. Greenwald, Fisher Wayland, representing DigiVox
   Ronald M. Harstad, Ph.D., Economist representing DigiVox

3. Julius Genachowski, Office of the Chairman
   John Prawat, President and Chief Executive Officer of DigiVox
   Eliot J. Greenwald, Fisher Wayland, representing DigiVox
   Ronald M. Harstad, Ph.D., Economist representing DigiVox

4. Rudolfo M. Baca, Office of Commissioner Quello
   John Prawat, President and Chief Executive Officer of DigiVox
   Eliot J. Greenwald, Fisher Wayland, representing DigiVox
   Ronald M. Harstad, Ph.D., Economist representing DigiVox

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In addition, on January 27, 1997, an ex parte meeting was held between representatives of DigiVox and the Commission staff as listed below:

Kimberly M. Baum, International Bureau
Jonathan V. Cohen, Auctions Division (on detail)
Bruce A. Franca, Office of Engineering and Technology
Nancy Markowitz, Wireless Telecommunications Bureau
Tom Mooring, Office of Engineering and Technology
Matthew Moses, Auctions Division
Ronald Repasi, International Bureau
Steve Sharkey, International Bureau
Thomas P. Stanley, Wireless Telecommunications Bureau
John R. Williams, Office of Plans and Policy
John Prawat, President and Chief Executive Officer of DigiVox
Eliot J. Greenwald, Fisher Wayland, representing DigiVox
Stan Kay, Assistant Vice President, Engineering, Hughes Network Systems
(Mr. Kay attended by telephone)

At the January 23 meetings, the representatives of DigiVox discussed many of the same issues as those reported in the January 16, 1997 ex parte letter. Those issues included auction schedule, frequency blocks and market areas, bidding credits, spectrum caps and number of licenses, and build out requirements. Since those issues are already discussed in the January 16 letter, the discussion will not be repeated here, except to mention one point regarding the auction schedule.

When DigiVox proposed that the acceptance of FCC Forms 175 on April 15, 1997 would constitute compliance with the requirements of the Omnibus Appropriations Act of 1997, P.L. 104-208, Title III, Sec. 3001(c) (1996), that "[t]he Commission shall commence the competitive bidding for the assignment of the frequencies described in subsection (a)(1) no later than April 15, 1997," both Julius Genachowski and Rudy Baca expressed concern that Congress might object to the proposal as too much of a departure from Congressional intent. DigiVox explained that the ultimate Congressional intent was to get the auction funds into the United States Treasury by September 30, 1997, and as long as that objective was achieved, Congressional intent was also achieved. Moreover, by providing enough lead time between the release of the report and order and the payment of the upfront deposits, more companies, both large and small, would participate in the auction, thereby making it more successful in fulfilling the budget objectives of Congress. Therefore, the acceptance of the Forms 175 on April 15, upfront deposits at the end of April, and holding round 1 a few days thereafter, would actually serve the underlying purpose of the legislation.

At the January 23 meetings, John Prawat also discussed technical concerns. In particular, Mr. Prawat expressed concern that the out of band emission limits not be set in a way that would effectively preclude use of the WCS bands for Personal Access Communications System ("PACS") technology, a low tier micro-cellular technology that would provide mobile wireless local loop competition. To this end, Mr. Prawat provided a January 22, 1997 letter from Stan

Kay, Assistant Vice President Engineering, Hughes Network Systems ("Hughes"). A copy of the letter is included as Attachment 1. In the letter, Hughes proposes out of band emission limits from WCS of 70 + 10 log (P) dB at the SDARS spectrum. To this end, Hughes proposes that the 2315-2320 MHz and 2345-2350 MHz spectrum be licensed as unpaired spectrum because it would not be usable for PACS with today's technology. Hughes also proposes that 2305-2310 MHz be paired with 2350-2355 MHz and that 2310-2315 MHz be paired with 2355-2360 MHz. By setting out of band emission limits as specified above, the 5 MHz buffer zone would make it feasible for the two 10 MHz paired blocks to be usable by PACS.

The January 27, 1997 meeting focused solely on the technical issues. In addition to the Hughes January 22, 1997 letter, DigiVox also provided a January 27, 1997 letter from Hughes and a January 24, 1997 letter from RC Malkemes of Bellcore. Copies of these letters are included as Attachments 2 and 3. In the meeting, Mr. Kay of Hughes explained the points that he raised in his two letters, including the fact that the January 27 letter corrects some errors contained in the January 22 letter. Mr. Kay explained that the 5 MHz buffer zone would protect SDARS from most out of band emissions that would result from using PACS in the two paired bands. In reality, because of the low power at which PACS operates, general background noise as well as noise from sources other than PACS, such as microwave ovens and harmonic effects from UHF TV channels 64 and 65 and land mobile stations operating in the 450 MHz band, would produce more interference to SDARS than would PACS. Therefore, the challenge faced by SDARS is to overcome these other sources of interference through more efficient design features in the SDARS receive equipment. Such designs would automatically protect against the lower level of PACS interference. For this reason, as long as the Commission adopts the proposed buffer zone, it should adopt out of band emission limits that would not make it prohibitive to manufacture equipment to be used for PACS in the WCS bands.

Subsequent to the January 27, 1997 meeting, DigiVox received a letter from Siemens Stromberg-Carlson supporting the Hughes proposal. A copy is included herein as Attachment 4.

Very truly yours,

Eliot J. Greenwald

cc: Michele Farquhar, Chief, Wireless Telecommunications Bureau
D'Wana Speight, Wireless Telecommunications Bureau
Thomas P. Stanley, Wireless Telecommunications Bureau
Nancy Markowitz, Wireless Telecommunications Bureau
Kathleen O'Brian Ham, Chief, Auctions Division
Jonathan V. Cohen, Auctions Division (on detail)
Matthew Moses, Auctions Division
Josh Roland, Auctions Division
Walter D. Strack, Policy Division, Wireless Telecommunications Bureau
Evan R. Kwerel, Office of Plans and Policy

John R. Williams, Office of Plans and Policy
Bruce A. Franca, Office of Engineering and Technology
Tom Mooring, Office of Engineering and Technology
Steve Sharkey, International Bureau
Ronald Repasi, International Bureau
Kimberly M. Baum, International Bureau
William E. Kennard, General Counsel
Peter A. Tenhula, Office of General Counsel
Lisa M. Higginbotham, Office of General Counsel
Catherine Sandoval, Director, Office of Communications Business Opportunities
Eric Jensen, Deputy Director, Office of Communications Business Opportunities
S. Jenell Trigg, Office of Communications Business Opportunities
Jackie Chorney, Office of the Chairman
Julius Genachowski, Office of the Chairman
Rudolfo M. Baca, Office of Commissioner Quello
David R. Siddall, Office of Commissioner Ness
Suzanne Toller, Office of Commissioner Chong
David W. Zesiger, Office of Advocacy, U.S. Small Business Administration

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ATTACHMENT 1

HUGHES
NETWORK SYSTEMS
A HUGHES ELECTRONICS COMPANY

January 22, 1997

John Prawat
President and CEO
DigiVox Corporation
P.O. box 65094
Washington, DC 20035

Dear John:

Hughes Network Systems (HNS), a business unit of General Motors Hughes Electronics, is a major supplier of cellular radio equipment and one of the driving forces behind the commercialization of the Personal Access Communications System (PACS). The Commissions Rules to Establish Part 27 offer potential bands in which PACS technology could be deployed if the interference into SDARS can be managed. The out of band emissions limits proposed by Primosphere of

Mobile Transmit	123 + 10 log (P) dB
Base Transmit	92 + 10 log (P) dB

preclude economical deployment of any present-day wireless technology. Lucent in its January 8 filing indicated that the diplexing equipment required would cost several hundred dollars, which is clearly not appropriate for a handset. HNS agrees with this assessment. Alternatively, backing off the handset power amplifier enough to give the desired linearity would require a much larger power amplifier than is practical for a handset.

Lucent, in their 13 January Supplemental Technical Statement, proposed fixed stations for both forward and reverse links. While this arrangement does provide adequate protection for SDARS, it limits the commercial appeal of the WCS bands because it eliminates mobile systems. Even in the case of Wireless Local Loop, a large part of its marketability is the concept of extended cordless service allowing the subscriber to take his phone to the park, the mall or the office.

11717 Exploration Lane, Germantown, MD 20876
Tel: (301) 428-5500 TWX: 710-828-0541
FAX: (301) 428-1868/2830

To accommodate SDARS and PACS in the WCS band, HNS proposes the following allocations.

Band	Frequency	Use
A	2305-2310	PACS Paired with E
B	2310-2315	PACS Paired with F
C	2315-2320	Fixed Voice/Data Unpaired
SDARS	2320-2345	SDARS
D	2345-2350	Fixed Voice/Data Unpaired
E	2350-2355	PACS Paired with A
F	2355-2360	PACS Paired with B

Bands C and D may use the out of band emissions recommendations offered by Lucent of

Subscriber Transmit	60 + 10 log (P) dB
Base Transmit	70 + 10 log (P) dB

and case-by-case interference mitigation as required.

With the frequency plan proposed above, Bands C and D serve as 5 MHz buffer zones between the SDARS and PACS equipment. HNS proposes that the out of band emissions in the SDARS band from the PACS equipment in bands A/E or B/F meet limits of

Mobile Transmit	70 + 10 log (P) dB
Base Transmit	70 + 10 log (P) dB

HNS proposes that the out of band emissions in the C and D bands from the PACS equipment in bands A/E or B/F meet limits of

Mobile Transmit	40 + 10 log (P) dB
Base Transmit	60 + 10 log (P) dB

It is important to note that, even with the 5 MHz buffer zone, the Primosphere suggested limits of 123 and 92 dB are not achievable in practical systems. Neither would a mobile transmit limit of 90 + 10 log(P) dB be achievable at a reasonable cost with today's technology.

The interference analysis for the reverse link is given in Table 1. It indicates that 70 dB isolation will be adequate to protect SDARS receivers from PACS handsets at a distance of 12 feet. This analysis incorporates the fact that PACS has a 12.5% duty cycle and that the handset is unlikely to be in the beam of the SDARS receive antenna. It also does not account for the fact that the PACS handset will be power controlled below 200 mw for most of its operating time.

Table 1. Proposed Reverse Direction Link Budget		
SU EIRP	- 2 dBW/1MHz	200 MW in 300 kHz (neglects power control of handsets)
SU Duty Cycle	- 9 dB	12.5% Duty Cycle. 312.5 msec pulses every 2.5 msec
Min Path Loss	-50.7 dB	12 foot separation is more realistic in vehicular traffic
SDARS Ant. Gain	3 dB	Per Primosphere filings
SDARS Beam Shape	- 6 dB	Hemispheric beam pointing up - loss of at least 6dB for typical PACS handset location in traffic
Polarization Loss	- 3 dB	Vertical to linear polarization decoupling
Total	-67.7 dBW/MHz	
Interference Allowed	137.9dBW/MHz	
Required Protection	70.2 dB	

Note that this analysis uses a noise floor of -135.6 dBW/MHz and an interference degradation of 2 dB for a protection ratio of 137.9 dBW/MHz as described in the January 8 Lucent technical statement

For the forward link, HNS agrees with pages 7-11 of the Lucent analysis with some minor comments. PACS base stations will sometimes be mounted as low as 25 feet rather than the 100 feet assumed in the Lucent analysis. This will raise the interference into SDARS by 12 dB. In these cases, the PACS base station transmit power would be limited to 4 dBW/MHz, i.e., 12dB less than used in the Lucent analysis.

Sincerely,

Stan Kay
Assistant Vice President, Engineering

ATTACHMENT 2

HUGHES
NETWORK SYSTEMS
A HUGHES ELECTRONICS COMPANY

January 27, 1997

John Prawat
President and CEO
DigiVox Corporation
P.O. box 65094
Washington, DC 20035

Dear John:

Hughes Network Systems (HNS), a business unit of General Motors Hughes Electronics, is a major supplier of cellular radio equipment and one of the driving forces behind the commercialization of the Personal Access Communications System (PACS). The Commission's Rules to Establish Part 27 offer potential bands for PACS technology if the interference into SDARS proves manageable.

In our 22 January letter to you we used the allowable interference noise energy of -137.9 dBW/MHz proposed in the 13 January Lucent Supplemental Technical Statement of Lucent Technologies Inc.. We had mistakenly assumed from Lucent's statement "After technical discussion with Primosphere Limited Partnership we agree that the WCS spectrum with SDARS in the middle of the band is unique...", to mean that Lucent and Primosphere had reached agreement on the parameters to use in the analysis.

After subsequent review, we agree with Primosphere that Lucent's assumption of 2000°K receiver noise temperature is unrealistic. On the other hand, we feel that Primosphere has failed to provide adequate justification for their claimed noise floor of 200°K. HNS is the leading manufacturer of Very Small Aperture Terminals (VSAT) and understands the noise floor behavior of satellite terminals. While 200°K is a reasonable number for VSAT and other satellite communications terminals with narrow beam antennas pointed to cold sky in C-Band and Ku-Band applications, we question its legitimacy for a 2.35 GHz, car-mounted antenna for the following reasons:

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1. The VSAT antenna does not pick up significant terrestrial emissions because there is minimal spurious noise generated at K_u Band and because the antenna points towards 0°K space. In contrast, the side lobes of the SDARs antenna will see a variety of terrestrial sources. The 2.35 GHz band is near the 2.4 GHz ISM band in which most microwave ovens operate. Interference may also come from harmonics of the 450 MHz band terrestrial mobile radio and UHF broadcast channels 64 and 65. In addition to potential signal emissions, the temperature of the people, buildings, trees, car ignitions, etc., in the antenna pattern will be much warmer than outer space. For this reason HNS suggests adding an ambient temperature of at least 290°K to the LNA noise temperature.

2. A C Band or K_u Band LNA uses a waveguide front end with very low loss. The SDARS receiver must reject the A, B, C, D, E and F bands. HNS estimates that this would require a filter ahead of the LNA with an insertion loss close to 2 dB. This is because the SDARS equipment receiver response must roll off before entering the neighboring WCS channels to prevent a signal from a WLL base or mobile station into the front end LNA.

3. Primosphere correctly states that the LNA Noise Figure may be 1 dB. A typical receiver noise figure, however, degrades as the signal passes through mixers, filters, etc., and for low cost design can closer to 2dB.

Based on the above, HNS estimates the effective noise floor at the receiver as follows

Thermal Noise	-168.6	dBW/MHz	
80° K LNA + 290° K Environment	26	dB	It may be worse than this when terrestrial sources are nearby
Filter Insertion Loss	2	dB	To reject bands A,B,C,D,E and F
Post LNA Contributions	1	dB	Mixer, Amplifiers, etc., following LNA
HNS "Worst Case" Scenario	-139.6	dBW/MHz	
Primosphere claim	-145.6	dBW/MHz	
Split the difference	-142.6	dBW/MHz	Used for the rest of this letter

HNS suggests a compromise noise floor between the excessively optimistic Primosphere value of -145.6 dBW/MHz and the non-optimal design configuration described by HNS resulting in -139.6 dBW/MHz. HNS believes that the FCC should require Primosphere to offer evidence that -145.6 dBW/MHz is their actual noise floor. For the remainder of this letter, HNS assumes a noise floor of -142.6 dBW/MHz.

Primosphere should also demonstrate the accuracy of their claims in two other areas, the antenna pattern and the allowable noise rise.

The antenna plays a critical role in the analysis. HNS assumes that the antenna is some sort of a flat panel antenna mounted on the roof of the vehicle. The metallic floor and the car body will prevent the antenna pattern from being omnidirectional. If the PACS handset is in a vehicle or at street level, it may not be in the main beam of the Primosphere antenna. Also, the vertical polarization of the PACS signal will interact in an unknown way at the beam edge of the circularly polarized Primosphere antenna. HNS will

use 3 dB main beam antenna gain for the Primosphere antenna, but include 6 dB of side lobe loss and another 3 dB of protection for linear polarization.

Allowable noise rise normally depends on the system margins. The typical fixed K_u Band VSAT application only needs rain fade margin. For SDARS, HNS expects that the largest need for margin would be for shadowing from buildings in urban areas. Primosphere should have included margin on the order of 6-10 dB for building shadowing. For the rural case there is less building shadowing, but HNS argues that the chance of a handset being very near an SDARS receiver in the rural environment is small. Both urban and rural environments should include 3-6 dB margin for Ricean fading. In such highly variable propagation environment, HNS argues that it is unreasonable to limit the noise floor rise from WCS to 0.2 dB. Even a noise floor rise of 2 dB is very generous because the handset contribution really should be combined in a root-sum-squared (RSS) manner with the shadowing and fading variances. Using -142.6 dBW/MHz as the noise floor and allowing a 2 dB rise, means an allowable interference level of -144.9 dBW/MHz for PACS.

HNS wishes to make one other point before presenting the link budgets. Since the A/E and B/F bands are spaced 5 MHz from the SDARS band, the PACS signal energy will be in the transmitter noise floor. The design constraint is controlling the broadband noise emissions. The typical design of the transmitter is a mixer from roughly a 300 MHz IF to the 2.3 GHz transmit band followed by a power amplifier. The noise floor comes from

1. *Noise entering the final mixer stage*. A SAW filter at the final IF can reduce this noise at 5 MHz from the band edge
2. *Final mixer noise figure*. Commercially available parts provide a noise figure of 10 dB.
3. *Oscillator phase noise from the final mixer stage*. Handset compatible frequency sources (reasonably priced, small, low power) will have significant phase noise energy at 5 MHz from the carrier. Since the output of the final mixer is in the transmit band, the filter Q to achieve meaningful attenuation from 2315 and 2320 MHz is unreasonable.
4. *Gain of the power amplifier*.. The final amplifier stage will amplify the noise at its input. To control this, one could use a high gain mixer to reduce the gain requirements of the final stage. These components are relatively expensive.
5. *Final amplifier noise figure*. Commercial amplifiers will have roughly a 10 dB noise figure in this band and at these powers.

Assuming an amplifier noise figure of 10 dB, a high power mixer with a -10 dBm output and a final amplifier gain of 33 dB, the noise input at the power amplifier must be -124 dBW/MHz. HNS contends that even the best known handset layout, packaging, and shielding techniques cannot do better than this due to the close proximity of the digital signal processing and the fluctuations of the power circuitry. Furthermore, HNS notes that four of the five techniques suggested by Primosphere's January *13 Ex Parte* filing are being used by HNS to suppress the broadband noise, i.e., frequency planning, spectrum shaping, filtering and cross polarization. The fifth technique, amplifier backoff, is irrelevant in suppressing broadband noise.

The above assumptions result in the link analysis given in Table 1.

Table 1. Proposed Reverse Direction Link Budget			
Handset Noise Floor	- 81.0	dBW/MHz	Broadband Noise is the limiting factor
Handset Duty Cycle	- 9.0	dB	12.5% Duty Cycle. 312.5 msec pulses every 2.5 msec
Min Path Loss	-51.0	dB	12 foot separation is more realistic in vehicular traffic
SDARS Ant. Gain	3.0	dB	Per Primosphere filings
Head Loss	-5.0	dB	3 to 15 dB typical for energy absorbed by human head
SDARS Beam Shape	- 6.0	dB	Hemispheric beam pointing up gives loss of at least 6dB for typical PACS handset location in traffic
Polarization Loss	- 3.0	dB	Circular to linear polarization decoupling
Total	-152.0	dBW/MHz	
Interference Allowed	-144.9	dBW/MHz	
Margin	7.1	dB	PACS provides more than the needed margin

For the forward link, PACS base stations will be mounted as low as 25 feet or as high as 100 feet. At the 25 foot height, the base station transmitter will be limited to 800 mw which is 6 dB more power than the handset. The additional gain required in the final amplifier stages will raise the noise floor by 6 dB. Table 2 shows that these assumptions provide 1.1 dB of margin in the forward direction. For base stations mounted higher, it will be possible to raise the power in accordance with the additional path loss afforded by the greater distance.

Table 2. Proposed Forward Direction Link Budget			
Base station Noise Floor	- 75.0	dBW/MHz	Broadband Noise is the limiting factor
Min Path Loss	-57.0	dB	24 foot separation for handset directly under base station
Base antenna Gain	6	dB	Omnidirectional stacked dipole
Directivity below base station	-20	dB	Dipole has very low gain below and above antenna
SDARS Ant. Gain	3.0	dB	Per Primosphere filings
Polarization Loss	- 3.0	dB	Circular to linear polarization decoupling
Total	-146.0	dBW/MHz	
Interference Allowed	-144.9	dBW/MHz	
Margin	1.1	dB	PACS provides more than the needed margin

HNS could evaluate other for the handset being in the antenna main lobe. The typical vertical beamwidth for a 6 dBd antenna is 10-20°. For the handset to be in the main beam it will be far enough from the base station so as not to pose a problem.

Sincerely,

Stan Kay

Stan Kay
Assistant Vice President
Hughes Network Systems

ATTACHMENT 3

Bellcore
Bell Communications Research

331 Newman Springs Road
Red Bank, New Jersey 07701-5699
908-758-2000

Response to FCC Rule Making for Wireless Communication Service ("WCS")

From: RC Malkemes
Bellcore
331 Newmans Spring Rd.
Redbank, NJ, 07701
908-758-3357

Date: January 24, 1997

Sirs;
Bellcore has been a pioneer and one of the driving forces behind the commercialization and standardization of PACS, and it's predecessor, WACS, for nearly 10 years. Bellcore supports and encourages the use of PACS in the WCS band and is in agreement with the Hughes Network Systems proposal submitted at this same time. This arrangement will allow the deployment of mobile WCS PACS devices in the 2305 to 2315 and 2350 to 2360 MHz bands while allowing WCS fixed voice and data devices in the 2315 to 2320 and 2345 to 2350 MHz bands. Further, this proposal allows the use of realistically affordable technology which is currently available for filtering and signal shaping techniques.

Other comments by Lucent Technologies, dated January 13, 1997, describe analysis based upon higher output base station equipment and do not specify a modulation technique, however this analysis also points out that the levels suggested by Primosphere are somewhat conservative, with which Bellcore agrees.

As stated in Primosphere's Technical Statement of January 13, 1997, page 3, PACS utilizes Raised Root Cosine shaping to reduce the modulation spectrum. The modulation waveform may further be rolled off by additional baseband filtering or IF type narrow band filtering when upconverting the waveform before final transmission. Because PACS uses $\pi/4$ Shifted QPSK modulation, linearity constraints require fairly linear RF power amplification be used. Therefore, the RF power amplifiers are "backed off" from the 1-dB compression point to prevent spectral regrowth as suggested by Primospere.

The path loss at 2330 MHz associated with a 12 ft. distance from mobile to SDARS station is calculated using;

$$P_L = 10\text{Log}\,(\lambda^2/(4\pi\,D)^2)$$

The calculated, free space path loss is 51 dB. Antenna directivity, head loss and polarization effects could cumulatively add another 10 dB to the total path loss figure. Therefore, in the 12 ft. mobile to SDARS station case, up to 61 dB of loss may be encountered by RF power amplifier wideband output noise and any other signal leaving the mobile unit before entering the SDARS reciever.

Compliance with the levels suggested Hughes Network Systems, therefore, are a matter of individual manufactures architectures and incremental cost tradeoffs. This proposal, in worse case scenarios, offers a reasonable set of solutions for both WCS users and SDARS providers.

Sincerely yours,

R C Malkemes

RC Malkemes
Director Radio Techniques and Technology

cc:
H W Sherry

ATTACHMENT 4

SIEMENS
Stromberg-Carlson

January 27, 1997

Mr. John Prawat, President & CEO
DigiVox Corporation
1250 24th Street N.W., Suite 350
Washington, DC 20037

Dear John,

Siemens Stromberg-Carlson, a market leader in the promotion and deployment of PACS technology, supports the proposal submitted by Hughes Network Systems to allow PACS to be used in the WCS band.

This proposal would allocate 20 MHz of spectrum (2305 to 2315 MHz and 2350 to 2360 MHz) for PACS mobility service and 10 MHz of spectrum (2315 to 2320 MHz and 2345 to 2350 MHz) for fixed voice and data services.

We believe that the proposal of HNS, with the 5 MHz buffer zone on each side of the SDARS band, will allow for PACS to be used in the WCS band without interfering with SDARS operation.

If you have any questions, please do not hesitate to call me at (561) 955-8001.

Sincerely,

John Tebes
Director PACS Edge
Wireless Business Unit

JT/mem